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ABSTRACT

This pamphlet surveys the whole field of environmental education. It has been written to describe and clarify environmental education, in preparation for the reforms called for by the Environmental Education Act of 1970. The environmental crisis is related to the evolution of civilization, technology, and consumerism: definitions, aims, values and principles are given. Student involvement and a realistic assessment of the difficulties in bringing about change and the assuming of personal responsibility are called for. Part II delineates a large role for education in environmental improvement and calls for programs both formal (in school) and informal (out of school). These programs should operate at all levels and use the full range of media. Local, state, and federal roles are described with a call for multiple funding at several levels and federal coordination. The ideal is nothing less than individual environmental awareness, understanding, and responsibility on the part of every citizen. (NH)

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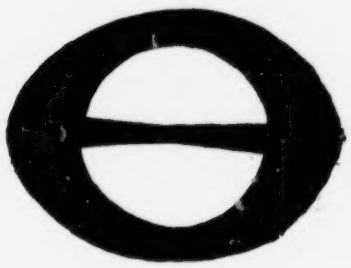
ENVIRONMENTAL EDUCATION

EDUCATION THAT CANNOT WAIT



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THE COVER--Title derived from the First
Annual Report of the Council
on Environmental Quality,
August 1970.

ENVIRONMENTAL LITERACY*

"The basic causes of our environmental troubles are complex and deeply imbedded. . ."

"It should be obvious that we cannot correct such deep-rooted causes overnight. . ."

"We must seek nothing less than a basic reform in the way society looks at problems and makes decisions. . ."

"Our educational system has a key role to play in bringing about this reform. . ."

"It is also vital that our entire society develop a new understanding and a new awareness of man's relation to his environment--what might be called 'environmental literacy.' This will require the development and teaching of environmental concepts at every point in the educational process."

-- Richard Nixon
President of the United States

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* From the President's introduction to the First Annual Report of the Council on Environmental Quality, August 1970.

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EARTHMANSHIP-STATESMANSHIP

President Richard Nixon, on October 30, 1970 signed the Environmental Education Act, which passed both houses of the Congress with large majorities*. This Act gives authority to the Office of Education, Department of Health, Education, and Welfare, to initiate, support, and coordinate a variety of efforts in environmental education.

The Act reflects a growing awareness of the relationships of man to his environment. Beginning slowly with the insights of 19th Century naturalists--and developing rapidly in late years through the vigorous and widespread efforts of educators and conservationists--the public is demonstrating a concern for the environment.

The new national commitment to environmental education, however, is more than recognizing an existing problem. It offers a means both to restore the environment and to live meaningful and ecologically sound lives. Students, especially now, are finding in environmental and ecological principles and values the keys to more satisfying life goals and life styles.

Environmental education itself has received relatively little attention in the press. For most people, it is still a hazy concept. The Congress and the President have described environmental education as "reform" in American education--a way of achieving quality in living, and of preserving the quality of our environment. It is to describe and clarify this concept that the booklet "Education That Cannot Wait" is published.

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* The legislation passed the House 289 to 28, and the Senate 64 to 0.

PART I

FOUNDATIONS FOR ENVIRONMENTAL EDUCATION

MAN AND HIS ENVIRONMENT

For eons, man was wholly influenced by nature. His numbers remained small, because food supply was limited and life was constantly threatened. Yet, man's searching, hunting, and escaping from dangers conditioned his responses to the environment, and led to his increasing reliance on thought rather than physical powers. Then he acquired tools and controlled fire and began to change the world about him. While his numbers were still few, his environment was extensive enough and sufficiently flexible to restore itself after his passage. To the extent that man was alert to the requirements of his surroundings, he survived. When he was careless, or passed up food supplies or ignored the signs of danger, he died. It was a long period, this Stone Age, and nature through processes of selection and survival helped shape the responses and culture of all human kind.

When man discovered agriculture and gained a relative abundance of food, he established villages and then cities. With the beginnings of civilization and the surplus of food and relative security, man grew in numbers and influence. The environment felt his weight. For the first time man began to alter his environment on a scale that nature could not quickly restore. This, in turn, had effects upon man which continue to this day.

Man, formed in ages of intimate contact with nature, reacted to crowding and stress with the instinctive aggressiveness of self-preservation. While a thin veneer of culture and newly-devised values held mankind together in what is called civilization, people continued to exploit their environment and each other to survive.

Nineveh and Babylon rose to dizzy heights and then fell into ruins because their inhabitants could not foresee environmental dangers and act in time to forestall them. Their life-support systems suffered. This included dislocations in their society, but principally they lost their forests from excessive cutting, and ruined their once productive agricultural lands through siltation of irrigation systems and accumulation of salt in fields.

The great centers of Toltec and Mayan civilizations withered for these or other ecological reasons. The story was repeated in Africa and Asia, where civilizations became unable to function for a variety of reasons or grew beyond the ability of their environment to support them. Civilizations have rarely struck a balance with their environments for more than a brief period of time.

The lessons of environmental awareness are learned slowly. In America, our teachers have included Henry David Thoreau, John Muir, Theodore Roosevelt, and Aldo Leopold. Their message is that the environment is fragile, our resources are finite. Through our great numbers and insatiable demands, and with the enormous power of science and technology, we disrupt the essential balances and inter-relations on which all life depends. Black smoke, yellow fumes, and even invisible poisons have polluted the atmosphere. Lakes and rivers die from the ecological effects of phosphates in household wastes and nitrates washed from the soil. Methyl mercury, an industrial pollutant in rivers and lakes, is poisoning many forms of life by entering the food chains. We cover the Earth with concrete and steel. For many millions of people, living has become mere existence. Many "lesser" species have become extinct, and mankind may be racing toward the same fate.

The ultimate issue, especially when considering the awesome potential of nuclear weapons, is survival.

First, however, we must learn about our relationships with nature, our dependence upon environment, the inevitable effects of our decisions and actions on vital life-support systems, and the potentials and flaws of the human species. We must acknowledge and accept the need for new attitudes toward the world, a human philosophy of life, and life styles which improve the quality of life.

OVERWHELMING TECHNOLOGY

Man, despite the advantages and potential of his science and technology, has all too frequently used them, through ignorance as well as stupidity, to reduce the quality of the life-supporting environment. Today, there are many well known examples of technological abuses, ranging from the effects of strip mining in Pennsylvania and West Virginia to the surprising tenacity and spread of DDT. DDT, principally used on agricultural land in the United States, is now found in the tissues of Antarctic penguins and Arctic snowy owls. The watertable in many areas continues to fall, not merely from pumping but because cities and highways divert rain runoff to the sea. Air pollution over the great urban and industrial areas of the world jeopardizes life and threatens long-term climatic change.

Catastrophes greater than these have been projected, and the possibilities are real. The sobering truth is: the reactions and interactions of everything mankind does are great and can never be known fully.

AMERICAN CONSUMERISM

More than two hundred million high-living Americans, almost six percent of Earth's population, consume nearly half of the world's harvest of resources. As a people, Americans consume what is assumed to be a natural birthright in land, water, air, and minerals . . . without much thought for the rights of others and with little thought for tomorrow.

Most people seem to believe that new resources will be found and corrective and recycling technologies developed to solve our problems and fill our needs. With 70,000,000 autos and trucks in the United States, the environmental burden goes far beyond exploitation of the land for the materials used in their manufacture. Autos also affect the quality of life through stress, usurpation of space, and pollution.

The vital importance of wise decision making--reflecting an understanding of the effects of technology and consumerism and the realities of the ecosystem and environment--must be recognized and understood by each one of us. It is the consequences of actions, based on individual decisions on everyday matters, which collectively become national problems . . . or answers.

For example, when we purchase a detergent we should stop to consider its phosphate content. Detergents with high phosphate content overfertilize waters and contribute to the early death of ponds and lakes. When we plan to drive our car, we might stop and consider more ecologically desirable alternatives. We know that automobiles pollute the air and use oxygen. On the other hand, walking or bike riding may be more healthful, and mass transportation may be the best way to go to work in the inner city.

The problem is our present way of life. While technology has made life easier for us in many ways, it has also vastly altered the environment. Not only is quality of life reduced, but the very web of life is jeopardized. A new life style is called for, based on the requirements of living within our environment. We must develop enlightened ways of living in harmony with nature and our world. Finding the way is not merely the Government's responsibility. It is not only our neighbor's attitude and manner of living which needs alteration, it is our own.

One way to begin this new way of thinking and of living is through environmental education.

ENVIRONMENTAL EDUCATION DEFINED

Today, man has the scientific and technological "know-how" to solve most if not all environmental problems. But decisions regarding man's use of his environment are seldom based on purely scientific knowledge. Virtually all human decisions are based on custom, oversight, economic feasibility, political expediency, social desirability, or religious belief. It has now become impossible to make wise decisions about the environment without an understanding of economics, history, political science, sociology, psychology, and the humanities, as well as the hard sciences. This calls for a new educational approach, environmental education, and this in turn needs to be defined.

The Environmental Education Act of 1970, landmark legislation which reflects a national commitment to the search for enlightened life styles, has provided its own definition of environmental education. The language of the Senate report explaining the Act follows:

> Environmental education is an integrated process which deals with man's interrelationship with his natural and man-made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation, technology, and urban and rural planning to the total human environment. Environmental education is a study of the factors influencing ecosystems, mental and physical growth, living and working conditions, decaying cities, and population pressures. Environmental education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and to improve the quality of life.

As stated in the Act, and in Chapter 12 of the report of the President's Council on Environmental Quality, environmental education (EE) is a process which will affect the entire continuum of American education. It is a design for reform because it will, through every aspect of formal and nonformal education, improve philosophies of life and help each citizen to acquire a new and more viable life style.

This objective was first defined by people in local communities, and has been given the highest national priority by the President and by the Congress. Survival as a culture and even as a species may depend on environmental education.

AIM OF EE

Environmental education is a life-long process. It is a way of looking at life, fostering awareness of other life and of inter-relationships, learning to recognize the effects (good and bad) we have on physical surroundings, and the responsibilities we must accept for the mere fact of our presence and of our activities in our environment. It should enable us to make sound ecological decisions and foresee their consequences; to make value judgments, and act accordingly. It is acceptance of life values and ways of living which minimize destruction and maximize those relationships that enhance life. It is learning how to contribute to the quality of life, and the constructive use, rather than exploitation, of the environment.

It is important to understand that EE is much more than a schoolhouse approach to ending the degradation of man-made surroundings and the pollution and destruction of the natural world. Environmental education will not simply provide an understanding of pollution problems and provide the Nation with skills to meet or solve those problems. It is not merely a course in school or a curriculum combining elements of the natural and physical sciences into a new department or specialty. Nor is it just another name for outdoor education, resource management, or conservation education.

Environmental education provides alternate ways of thinking--a synthesis--which colors and affects the humanities, languages, social sciences, history, economics, and religion as dramatically as it does the natural sciences. It will give an ecological perspective for every aspect of learning.

EE VALUES AND PRINCIPLES

If environmental education is to be successful, the philosophies developed and the life styles encouraged must be predicated on values that are personally appealing and acceptable because they are themselves satisfactory, attractive, pleasant and desirable, and are harmonious with ecological principles.

Actions consistent with ecological principles include:

- Recognizing and accepting personal responsibility in decision making and stewardship toward the environment, and becoming increasingly aware and concerned about those aspects of ecology which directly come within the province of each individual. (This is in contrast to "I have my own problems" or "Let George do it" or "I'm just one person, what can I do?")

- Living in the environment with minimum disturbances to the rights and habitats of other living things, consistent with the health, safety and certain basic comforts and pleasures of man as the dominant species. (This is in contrast to the thoughtless or willful destruction of living things, without regard for consequences, although hunting and fishing may be appropriate as long as they don't jeopardize the species.)

- Using only such resources as are required to maintain life in a balance of health and productivity permitting reproduction of the species at an optimum level, affording ample opportunity for growth of the mind and spirit, and encouraging artistic and creative expression. (This is in contrast to capricious use of resources and "conspicuous waste" in consumption beyond the manifest needs of the individual or group.)

- Making use of materials and energy in the most economic manner, balancing a supposedly desirable end against other possible ends. (This contrasts with seeking immediate pleasures rather than doing without in consideration of other benefits or long-term advantages. An example is insisting on quick and speedy "muscle cars.")

These values would also include: health and safety in a pollution-free environment; privacy and quiet, with reasonable absence of persistent stress; quick, safe and pollution-free travel at moderate cost; good design in public works, reflecting freedom and openness and other human needs as well as utility and economy; employment in circumstances of dignity and with incentives; and reasonably comfortable standards of living, reflecting rewards for merit. Without question, many would also insist that living ecologically would also insure such values as reverence for life, peace, freedom from coercion and poverty, freedom in the expression of opinion and the right to learn, receiving and giving quality, value and service in business, dealing fairly and honestly in personal relationships, ans having governments which are responsive and responsible to the electorate.

In summary, living consistently with ecological principles should protect and add to many important and acceptable human qualities or values.

PRESERVING FREE CHOICE

All Americans should be given the opportunity through programs of environmental education to develop ecological values that will complement the political, social, economic, and religious values that have been the basis for human decision-making processes. Changes in attitudes and behaviour concerning our world and our way of life must come as expressions of individual choice, and hopefully our educational programs will provide sufficient information to create awareness of a wide range of environmentally-desirable options. Of necessity, these options must be tentative and pluralistic even after the Nation arrives at a consensus as to the more desirable environmental/ecological values and principles.

Even as the American people develop national goals, objectives and strategies in environmental education (accepting the need for evolving an enlightened philosophy of life and new life styles), our political heritage calls for two major assumptions. They are:

- Educational activity must work within the framework of local democratic government, which has as its tenet the freedom of individual choice and respect for the individual person.

- Efforts in environmental education will not be dogmatic with respect to existing social or religious values--or coerce behaviour--but will offer alternatives. These must be in a context of balance and perspective which will assist individuals and groups in better decision making. Diversity may be preserved within a growing sense of community.

STUDENT INVOLVEMENT

For a number of years, progressive teachers and innovators -- and many responsible schools and educational systems -- have addressed themselves to human problems in an ecological context. They have advocated many changes and instituted many of them on a pilot basis.

First, these innovators have declared it not unreasonable for the educational community to be held accountable for their product. They also emphasized awareness, concern and involvement with everyday, "down-to-earth" problems. To be relevant to real-life situations generally meant that course content and approaches should be issue oriented. These approaches were responsive to the needs of the times.

Educators foresaw these needs and called for educational reform years ago. They did not call forth student militancy but only hoped to meet the issue of student frustration before it became urgent. Today, environmental and ecological approaches to domestic and world problems and to education have offered the "hope" which psychologists say must exist if energies are to be directed usefully.

The educational process needs improvement to meet the needs of youth today. The reason for this is that the modern youngster -- physically maturing earlier, surrounded from birth by a proliferation of fact and opinion from the mass media, and increasingly aware of conflicts between an old culture and new values -- is largely excluded from decision making and meaningful participation in our society.

If educators and schools do not meet today's issues, then the Nation must look on in dismay as highly active youth take to the streets in their frustration. "Confrontation" is a phenomenon which stems directly from the belief of young people that decisions affecting their lives and their future are being made by an establishment out of touch with the realities of the human ecosystem.

Young people prefer to respond positively to the all-encompassing environmental challenge. On Earth Day -- April 22, 1970 -- many young Americans demonstrated their concern with their environment and with society by a concerted, constructive approach. Through speakers, special studies, films, and seminars they committed themselves as individuals and as a generation to solve environmental problems and to live ecologically sound lives.

SOCIAL REALITIES

There are numbers of obstacles to beneficial change in our culture which are largely political, social, and economic. Some of these are readily recognized and identified. They include long-accepted and self-centered life styles, the weight of crushing poverty, illness and disability which sap strength and limit opportunity, stifling living conditions and stress of the ghettos, ideological wars, and self-perpetuating power structures.

All these obstacles have been identified as ecological dislocations and learning to identify them is the first step in dealing with them.

Some obstacles escape easy identification. An example of this is organized crime, which exploits human weaknesses for profit and personal aggrandizement. Criminal syndicates are power structures which affect life goals (and jeopardize the lives) of large numbers of people. This is an ecological situation as critical as is the existence of a man-eating tiger to the life of a villager in India.

The inability of American society to deal effectively with organized crime in this century may be because the criminal syndicate represents the ultimate manifestation of competitive enterprise, unfettered and unmoderated by any social consciousness or responsibility. This could be a vestige of the era of "mountain men" and "robber barons." This philosophy is one of personal aggrandizement long featured in American folk lore and the media.

That a socio-ecological problem of this magnitude can be dealt with successfully is indicated by the increasing acceptance of social responsibility by American big business, and by public insistence on accountability.

NO "EASY" SOLUTIONS

Recognizing a problem is one thing. Identifying the elements of the problem, and finding solutions, is a complex and difficult thing. There is always the danger that having identified a problem we will suppose that because we talk about it learnedly we are solving it.

One example is over-population. The population of the Nation and of the world increases rapidly because of one complex factor. All living things produce seed and offspring far beyond the possibility of the environment to support, if all live. Man has applied his talents and energies for millennia to the task of survival. As a result, more of his young live and fewer of the mature and aged die. Only now has man approached the limits of his world-wide environment.

Meanwhile, as the population crisis looms, man has gained insights as to a first alternative. There is hope, however, for there is evidence that the birthrate drops when society as a whole reaches a standard of living and a cultural level where there is a consensus as to optimum family size.

While some individuals practice family limitation, there are others who for religious, cultural or economic reasons have very large families. The "gulf" in value judgments between the various groups now seems to preclude the consensus which leads a culture as a whole to reduce family size.

Since ecological problems are complex, the solutions will be complex and will not be accomplished overnight. Finding a way of life that leads to harmonious relations with the environment (and with other men) will, for most individuals, require major reorientation. This calls for acceptance of new values, a growing awareness of inter-relationships and of ecology, and a recognition of personal responsibility toward all life in individual decision making.

There is an inevitable inertia which dictates to a large degree the speed with which change can be effected. As we are dealing with attitudes and behavior, we are dependent upon education to help individuals modify these traits. This requires time.

CHANGE AGENTS

The idea that new legislation, new laws, and tougher enforcement will solve most problems has weakened many movements in the past. After the verbal explosion that initiates and enacts such legislation comes an inevitable reaction, for there is the feeling that the battle is won, someone is doing something about the problem, and we can relax. The political-legislative route to reform may be flashy and exciting but it can be only a beginning, unless it is already a response to broad-based, long-felt needs of society.

Laying a philosophical foundation for the redirection of society is, however, an important function of political action. In accomplishing this, the responsibility turns to a number of change agents of which government is but one.

Environmental education calls for an effort at basic cultural change which will be intensive for the first two decades and in the process become an integral part of all human learning. The responsibilities of EE will be shared by national, State and local governmental units, but many change agents will be involved besides the instruments and personalities of government.

These will include the schools, business, industry and labor, museums, parks and media, peer groups, and the family.

These groups will function in response to individual leadership. The quality of that leadership will be determined in large measure by the individual's environmental literacy. It is the major challenge of EE to assure each individual of obtaining a high quality of environmental literacy.

There is no question that an environmental approach to education is underway throughout the Nation. The ethical and social foundations of EE have deep roots in the American identification of our national character with the wilderness and the frontier.

There is a dualism in America's attitude toward the wilderness. The challenge of the American wilderness stimulated a strong survival instinct in the people who faced it. For many this became an "it's nature or us" philosophy. And this became in some an attitude of "take yours while the getting is good". This approach was important to the successful settlement of the West and survival of the pioneers. It created few problems as long as numbers were small and the wilderness relatively extensive.

Poets, writers, artists, and naturalists have had an attachment for the wilderness from earliest days in America. It is notable that few of these have attempted to live exclusively in the wilderness. However, from their artistic expression have come much of the response of the conservation movement and "land ethic" which has colored American thinking for more than a century. It is this group's emotional or intuitive response to wilderness that today gives man -- with his burgeoning numbers and dwindling resources -- the desire and insight to find adaptive alternatives.

CONSENSUS IN LEADERSHIP

Almost everyone today gives at least lip service to concern for environmental issues. Many of the issues have had extensive reviews in the news media. The public has become informed and concerned about pollution, the accumulation of solid wastes, the implications of the "population explosion," and the economics and morality of wide use of chemical poisons, herbicides and defoliants.

The more informed the individual, the more he realizes that environmental problems are really ecological problems. He knows that there is a web of life, an ecological imperative, which man affects with his activities. He may even speak learnedly at cocktail parties of the need to restore the "ecological balance."

Few people realize, however, that the issue is far broader than these statements admit. Further, the inter-relationships of life are in constant change... and there is infinite interchange in the effects which one form of life has on all other forms...and "ecological balance" is not the best expression to use in describing these dynamic processes of life. For the truth is that man lives in and is part of nature, subject to all the rules and penalties of living in nature. He is the maker and recipient of innumerable changes in the environment and he must learn to live ecologically if he is to thrive and even to survive. This is the great issue of the day.

Each of us must realize that individually and collectively we have responsibilities toward the Earth on which we live and the niche which we occupy. The living Earth has shaped us and we cannot really "live" apart from an intimate and daily relationship with our natural environment.

While some may suppose that we can be healthy in mind and body in a totally artificial and controlled environment, like hens in the wire cages of an "egg factory," such a life is unnatural, nonecological and inhuman. It is not enough to survive, we must preserve our essential human and natural heritage and develop the integrity, dignity, and potential of human beings.

This recognition -- this philosophy -- has increasingly been emphasized by scientists and educators in the past decade. One of these is Rene Dubos, head of the Department of Environmental Bio Medicine at Rockefeller University.

In the July 24, 1970, issue of LIFE, Dubos wrote:

> The problem of the environment involves the salvation and enhancement of those positive values which man uses to develop his humanness. It involves, ultimately, a social organization in which each person has much freedom in selecting the stage on which to act his life: a peaceful village green, the banks of a river, the exciting plaza in a great city. Survival is not enough. Seeing the Milky Way, experiencing the fragrance of spring and observing other forms of life continue to play an immense role in the development of humanness. Man can use many different aspects of reality to make his life, not by imposing himself as a conqueror on nature, but by participating in the continuous act of creation in which all living things are engaged. Otherwise, man may be doomed to survive as something less than human.

The environmental approach to education is growing from the roots of Aldo Leopold's "Sand County Almanac" of 25 years ago to the vast number of movements and experiments in EE at the local level in the communities and schools of the country. These innovative and pioneering efforts in EE have had a significant effect on Boards of Education, upon Representatives and Senators in the Congress of the United States, and upon the offices, commissions and departments of the Executive Branch of Government. These have responded with definitive statements and actions, with the President taking the lead.

The full implications of environmental education, and the conclusive commitment of leadership at nearly all levels in America, may be shown in these words:

Margaret Mead, anthropologist, in testimony before the House Select Subcommittee on Education considering the Environmental Education Act of 1970, said:

> "I think the best structure is the continuous participation of children and high school students and college students, but particularly school children in every community, because you have a new crop of them every year, and what we need to look at now is ways of providing regenerative cycles for dealing with problems that are going to be continuous...
>
> "One of our principal problems is to change the whole climate of feeling so that man ceases to see himself as against nature, as at war with nature, or in dominion over nature...and instead sees himself in nature."

Gaylord Nelson, Senator from Wisconsin and one of the several sponsors of the Environmental Education Act of 1970, said in testimony before the Senate Subcommittee on Education:

> "Our goal must be an environment of decency, quality, and mutual respect for all living creatures...
>
> "It will not, however, be possible to understand much less develop these broad national environmental policies until the relationship between man, nature, and the artificial world are totally reexamined.
>
> "Our attitudes, values, and modes of behavior need to be modified but that cannot be accomplished until we face the new realities of a society in danger from its own environmental destruction.

"The educational process is the only way to develop that understanding and commitment..."

William A. Steiger, Congressman from Wisconsin, on the floor of the House in debate on the Environmental Education Act of 1970 said:

"...It has become evident that the people of America do not possess a full understanding of their responsibilities for the maintenance of our environment. Because of this fact it is important to make certain that the Nation's people be made full aware of their interdependence with the total environment and that they gain the knowledge and concern to begin finding solutions to current ecological imbalances and to prevent future ones...

"Environmental education will enhance the quality of our peoples' lives by helping improve the environment and brighten their appreciation of the life support systems which make life possible."

President Nixon, in his introductory remarks to the First Annual Report of the Council on Environmental Quality, emphasized:

"The newly aroused concern with our natural environment embraces old and young alike, in all walks of life. For the young, it has a special urgency. They know that it involves not only our own lives now but the future of mankind. For their parents, it has a special poignancy -- because ours is the first generation to feel the pangs of concern for the environmental legacy we leave to our children.

"At the heart of this concern for the environment lies our concern for the human condition: for the welfare of man himself, now and in the future. As we look ahead to the end of this new decade of heightened environmental awareness, therefore, we should set ourselves a higher goal than merely remedying the damage wrought in decades past. We should strive for an environment that not only sustains life but enriches life, harmonizing the works of man and nature for the greater good of all."

The President of the United States, representing all the people and having the responsibility for meeting the needs of the Nation above any special interests, has clearly and definitively committed the Administration to EE. He has put the official seal on a broadly based and compelling philosophy: If we are to preserve our heritage, our environment, our Earth, we must change. We must become aware of our environment, show concern for our effect on the ecosystem, and be committed to making decisions which reflect positively our awareness and concern.

There is no question that man must learn to live ecologically responsible lives. There is no alternative. We have no easy out through politics. We cannot protect our environment through legal means alone. It is not even a question of first trying educational means to persuade people to live responsible lives. EE must succeed, for education has always been and must always be the instrument of constructive, evolutionary change in a free society.

A critical aspect of the American system is that power is widely dispersed. Where power and authority to act may be found in large numbers of individuals, responsibility is also broadly based. Each person who is able to take action which affects our environment -- and that includes everyone, at some level -- must recognize his responsibility to act wisely. Education in the home, in the school, on the job, and in society as a whole is the means to accomplish change.

Education must teach each person that he bears the responsibility and the burden to live according to ecological principles.

The nature of our society pre-exists in and is determined by the means we choose and use to attain goals. The freedoms, guarantees, and responsibilities which frame environmental education are not only the processes of democracy, they reflect the dignity and value of individual life which is their objective.

PART II

APPROACHES TO ENVIRONMENTAL EDUCATION

THE ENVIRONMENTAL EDUCATION CONTINUUM

Environmental education is that education which develops in man recognition of his interdependence with environment and all life, and a recognition of his responsibility in maintaining the environment in a manner fit for life and for living.

Why are so many people now concerned with the quality of the environment? Because education for many decades has failed to give priority to the study of the environment in its formal and nonformal* programs. During the past several years in which there has been noticeable environmental deterioration, curricula in every educational category and at every level have been reorganized, revised,and developed anew. These curricula have given little or no recognition of the urgency of environmental problems.

A "conservation ethic"--not to mention an "environmental ethic"--has not yet been accepted by the average citizen, the industrialist, or even the educator as a concept of primary importance. Consequently, it has not yet become an essential factor in shaping national policies or education programs.

ROLE OF EDUCATION IN ENVIRONMENTAL IMPROVEMENT

In pre-industrial times the major role of education was to pass on the culture that had made the society cohesive and successful. Change was frowned upon, tradition held sway. In such societies, formal education was primarily for the young and for privileged classes that had time to explore new directions.

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* "Nonformal" is deemed more explicit than the commonly used adjective "informal."

In post industrial times, change gained the upperhand from tradition. New information necessary for success in society proceeded to accumulate rapidly. Education became necessary for more and more people. At first this increased education was based on new factual material, but as knowledge accumulated it has become increasingly necessary for the young to acquire the process of learning rather than transmission of tradition. Adults now must continually unlearn old facts, concepts, and skills and replace them with new ones.

In today's world, education has become a life-long process. It proceeds both formally and informally through schools, private organizations, communications media, and continuing experiences. No serious or effective modification or improvement of attitudes and behavior of man towards his environment can occur without broad educational efforts at all levels of our society. People need to learn ways to perceive environmental problems and opportunities, to acquire the information for forming and evaluating alternative actions, to develop the cultural skills for living according to chosen alternatives. All of this demands a high and continuing educational input. It is the only effective way to deal with the constant and rapid change in our current cultural environment.

Educational systems must provide the learner with the skills of continuous learning, and continuing flow of information about man and his environment.

EDUCATIONAL EXPECTATIONS

Environmental education should begin with an understanding of the basic philosophy of education. Education is more than picking up a few useful tools during one's school years. The social and vocational skills provided by education are essential. Yet almost everyone would agree that education is much more. Education is progression, a growth of mind and spirit. Education is a process, the making of personal experience out of information. It is not something imposed from without. All real education is self-education.

The truly educated man perpetuates the childlike wonder with which he first encountered life. He is excited by exploration and discovery. He is fascinated with the difficult and mysterious, and is delighted with challenge. He matches his capacities with standards of excellence. He commits himself to quality.

Education is founded upon, deals with, and strengthens many moral characteristics of man. These include personal dedication to something of worth, patience in overcoming adversity and ignorance, courage in facing the unknown and that which seems insurmountable, tolerance of others (including their ideas and life styles), and the humility to admit that after all is said and done one might be wrong.

Teachers are important, but not essential, in all aspects of education. Indeed it is often remarked that the long-term influence of an inspiring teacher is impossible to measure. On the other hand, teachers have an alarming and far reaching capacity to stifle everything which we believe constitutes education. For these reasons, teachers must themselves be well educated, show concern and even love for their students, and relate course material to everyday life problems. One of the objectives of environmental education is to increase the number of inspired and inspiring teachers.

It is to this broad philosophy of education that EE directs itself, for environmental and ecological studies concern both a way of learning and a way of living.

PROGRAMS OF ENVIRONMENTAL EDUCATION

Programs of environmental education will involve the entire American educational system, both formal and nonformal. A formal educational system in this context is one which is targeted on specific student-teacher relationships, through specific curricula. A nonformal system is less definitive and structured and is directed toward the public at large, or particular segments of the general public.

The formal education system, from preschool through continuing education, will directly affect about 50 percent of the American population in this decade. Initially, the principal effort in environmental education should be that of developing supplementary materials that are designed for the traditional curricula such as English, biology, mathematics, and history. In addition, the development of new curricula applicable to nearly all teaching and learning situations should be initiated. The approach is to infuse environmental and ecological concepts into all studies which lend themselves to changing man's life style to one of harmony with his world.

Another approach for school systems might be that of developing a special environmental curriculum through which the traditional subjects would be learned. A third approach, but less desirable at the primary and secondary level, would be the creation of a new course called environmental studies.

The challenge for formal education is the establishment of curricula with relevant ecological content, presented in a way to meet the present high motivation of students. This means that we must take advantage of all opportunities to relate learning experiences to actual environmental improvement and problem solving in the community (frequently referred to as "issue orientation").

The school must divorce itself from the traditional classroom concept and expand its frame of reference to make full use of all community resources in the curriculum. Environmental study areas, museums, libraries, local businesses and industries, and local government agencies all have a role to play in formal education.

The school administrators and teachers should orchestrate these resources into a workable curriculum, rather than concentrating on classroom materials. To accomplish this, it is imperative that a close working relationship (and frequent dialogue) be established among students, educators, businessmen, union leaders, and representatives of government at the local, State, and regional levels.

This will assist in formulating educational programs and activities that are relevant to real life issues... and give students the values, attitudes, and methods they will need to solve present and future problems deriving from pollution, increasing population, growing technology, resource depletion, and other environmental issues.

Nonformal education will reach important segments of the general public (and in some cases the entire population of a locality) with environmental education programs. This will be a major responsibility of local and national media, volunteer agencies, business and industry, and other private organizations.

It is essential that both local and network television, radio, film studios, newspapers, magazines, and book publishers contribute increasingly to informing the public about critical environmental problems and their possible solutions. In addition, the vast advertising and promotional resources of business and industry may be directed toward environmental and ecological issues.

Many private and volunteer organizations look to school facilities and personnel--as well as to the children, their parents, youth, and others directly related to the educational activities of the schools--for full utilization of the programs and activities these organizations offer. Such programs presently include square dances, spring and winter festivals, musical and dramatic productions, nature hikes and bird walks, and similar activities. In addition, museums and libraries frequently arrange for special exhibits, films, or discussions of interest to general or special groups.

Increasingly, as part of a comprehensive effort in environmental education, these voluntary and private agencies may wish to orient their programs toward EE objectives and to plan them in cooperation with local schools and colleges capable of providing assistance and publicity.

It would be desirable for a national non-profit organization to accept as its primary task the creative role of encouraging, advising, and assisting private organizations and business to orient their considerable resources in nonformal education, information, promotion and advertising toward EE objectives.

The emerging role of the local school system as participants in nonformal education should be emphasized. Everyone can recall situations in their hometowns and communities where administrative staff and teachers of local schools have contributed their talents and services, as well as the school facilities, to worthwhile community projects such as curtailing drug abuse. A vastly broadened activity of this nature is called for if all the varied educational resources of any community are to be coordinated in a nonformal EE effort.

Nonformal environmental education, sparked by local schools, may include sponsorship of seminars, briefings for businessmen and community leaders, public forums and exhibits, informational programs and contributions to media, operation of centers for volunteer activities, and development of clearinghouses for environmental information.

Correlation is the key to full utilization of community resources, and the local school system may be the best or only public agency available to carry out the responsibility.

Training Programs

The need for trained personnel in all branches of EE is critical. This includes the training of educational personnel, environmental management technicians, and orienting other professions in EE concepts.

Environmental education has emerged as the synthesis of widely diverse disciplines. For this reason, the development of educational personnel must recognize the opportunity and the unique circumstances surrounding the potentials for environmental education.

The present generation of educators faces a challenge in environmental education which is typical of this age. Frequently, students are as concerned, committed, and knowledgeable as their teachers. Through TV and other media, they may learn even faster than their teachers. This calls for a new learning-teaching style, a more informal instructional setting which is conducive to problem-solving approaches to learning, and, finally, extensive cooperation among all staff members of the school.

Teachers must be aware of environmental and ecological concepts and issues, and should be given the opportunity to develop necessary skills through in-service training programs. They should also be involved directly in the development of environmental curricula. Teacher training programs must also be redesigned to prepare new teachers for the challenge and responsibility of EE. To be effective in this new role the teacher must render support to and be supported from three areas:

- Administrators and supervisors must be attuned to the new strategies required in EE. Well prepared teachers cannot work effectively if the system does not support them. This calls for a flexibility of response from the system and from individual administrators.

- The librarian must be prepared to keep the teacher informed of current, as well as new and developing resources in EE. This is a necessary link between the individual school building and the local, State, and national network of dissemination.

- The paraprofessional can provide valuable support both as a direct link to the community and as an informed assistant in a variety of roles within EE. Whether these individuals function as assistants in the library, in administration, in resource centers or in the classroom, they must attain basic awareness of the broad goals and objectives of EE and of the significance of their task in the total program.

Manpower Training

The Administration has called for an expenditure of 10 billion dollars for the 1970's in the Nation's battle against pollution. Most of these funds will go into construction and other forms of physical capital. If we are to utilize effectively these new facilities, we must make the decision now to invest in the training of people who will not only operate new plants but who are also capable of working effectively across the entire field of environmental management.

What is needed are carefully prepared short and long-range plans that examine the manpower need in qualitative terms, as well as evaluating present and required sources of supply. There is no single agency with clear authority for developing environmental manpower at the Federal level. Perhaps there shouldn't be. But there is certainly a need for coordination of the efforts in this critical field. Not to coordinate is to risk a serious duplication of efforts and resources and we have too few resources to waste.

Another aspect of the environmental manpower problem concerns the experience, training, and educational requirements for employment in this rapidly emerging career field. Institutions are doing an excellent job of training young men for productive employment in many technical fields, but the emphasis is on specific problem solving and analysis in very narrow areas. This is precisely what must be avoided in preparing people for careers that require a broad environmental perspective. Introducing change in a successful but specialized system is a difficult but necessary task.

Educators must be prepared to search out and consider a number of alternative paths for developing this critical manpower. Therefore, research, evaluation, and focusing a national spotlight on new, inventive, and successful programs in the field of environmental manpower development will be emphasized by concerned administrators. A leading role is being played by community colleges in developing training programs of this type.

Environment and the Professions

An EE dimension is also a necessity for professional education. As the Nation has begun to adopt environmental quality legislation, the legal profession is now faced with an immediate need for specialized programs in environmental law in order to cope with the resulting litigation. Certainly, those in the medical professions, the engineers, the economists, and the city planners will all need an understanding of the ecological principles that interface with their particular disciplines.

Since most professions have organized themselves into associations which hold conferences and exchange ideas in professional journals, the practicing professional can probably best be reached through his professional association.

Developing the curriculum base for the education of undergraduate and graduate degree candidates is, however, a much longer-range undertaking. Initial emphasis will be directed toward multidisciplinary change as well as the evolution of new undergraduate and graduate programs.

ENVIRONMENTAL ENCOUNTERS

Environmental education is basically encouraging and eliciting in children and others an awareness of environmental problems and ecological processes. It also fosters concern for the environment and for what is happening, and a growing sense of personal and group responsibility for the environment and for actions which affect the environment.

This may be accomplished through a series of environmental encounters, as devised by William B. Stapp of the University of Michigan, to link relevant ecological, economic, social, technological, and political factors. These encounters are meaningful environmental experiences to enhance existing instructional programs, particularly where ecological significance needs to be added to traditional subjects.

A program of environmental encounters, through both school and nonformal activities, leads to personal involvement with environmental problems or situations. This is the method of learning.

Environmental encounters also encourage respect for the environment and a personal commitment to improving quality of life. This may involve behavioral modification.

A simple and conventional encounter would be a study and work trip to a stream or other natural area. Another, and perhaps more cogent experience in environmental awareness, would involve people with different social and economic backgrounds.

Students who come from middle-class suburban homes could work as teaching assistants with younger children from socially and economically deprived inner city families. These children are frequently unfamiliar with ordinary things such as a "bookcase," or concepts such as a "circle." The students will begin to understand the problem as they develop and apply solutions.

Before the experience, the students will need brief instructions in technique. After the encounter, the students may discuss and report on the socio-ecological implications of the life style encountered.

As may be seen, an encounter is a personal experience with some aspect of the environment in a situation of challenge and where some kind of decision must be made.

Young people are learning that the role of citizen calls for them to make decisions which affect their environment. They are most likely to make wise decisions in areas in which they have had prior experience in decision making, not merely knowledge. This includes voting, buying, resisting exploitative advertising, proper land use, and asking pertinent questions (as part of the process of holding businesses and politicians accountable).

ENVIRONMENTAL CURRICULA

Entirely new curricula in environmental education need to be developed for all grade levels. This would normally be a five-year process, but the need is immediate. Early attention must therefore be given to providing teachers with materials which can be integrated into current curricula.

While this immediate need is being met in part, curriculum development must begin on a conceptual framework suitable for 20 years or more of environmental education. This work will build upon the experiences, innovations, and recommendations of many educators. Neither the Office of Education nor any single State agency will evolve such a total program apart from contributions of many agencies, local schools, and individuals.

Toward such a synthesis, and illustrative of the curricula and curriculum materials needed, some tentative priorities and objectives may be advanced.

Tentative priorities include:

- Provision of materials to be used with existing curricula for pre-school, elementary, secondary, community college, and adult education levels.

- Development of materials to be used for nonformal adult education programs, including those of educational television.

- Curriculum development for the secondary level, and then for other levels according to need.

- Curriculum development for teacher training, including inservice training.

Tentative objectives may be considered for each of five educational levels, as follows:

- Preschool and elementary. At this age level, emphasis should be given to increasing the child's perceptual level through appreciation of space and form, the more evident relationships between man and nature, and a general appreciation of nature.

- Secondary. A more sophisticated understanding of ecological systems may be emphasized at this level, especially the relationship of man to his total environment. The student should also develop an increased awareness of the social, political, and economic causes of environmental problems. He will also develop at this age an understanding of the various options for remedying problems, and the implications of these options for man.

- Undergraduate. Through multidisciplinary, problem-solving courses, college students should be able to relate the scientific, political, social, and economic aspects of environmental problems and to make value judgments leading to sound decisions. This will include a special emphasis on environmental/ecological concerns as they relate to traditional courses and disciplines such as history and literature.

- Graduate. Professional training through specific environmental/ecological courses, training in environmental quality control, and orientation to environmental/ecological concerns for professional students in medicine, law, public administration, etc.

- Adult education. Providing supplementary and refresher course in environmental and ecological subjects, relating everyday-life situations to behavioral problems and decision making which affect the environment.

ADMINISTRATIVE RESPONSE TO EE

Educators need to assess the resources available and to set goals in environmental education. Judging from current public interest, there will be a popular response to EE. Administrators may assume that they will receive support from the public in efforts to tie into national programs in environmental education.

To take full advantage of the unique opportunity offered by this general interest and support, it is essential that administrators begin by identifying the few who understand this complex subject and recruit them to assist others to comprehend the problems and the opportunities. Those who best understand the problems and opportunities are distributed throughout the country in elementary and secondary school systems, on college or university facilties, in foundations, in business and labor, and in numerous voluntary organizations. Therefore, educators should be encouraged to emphasize:

- Assessment of local education resources in and out of the school system.

- Development of community/State/regional plans which will reflect the major needs of the regions.

To assist planning at the local level, the Office of Education recommends that early consideration be given to:

- Elementary and secondary education: supplementary materials, inservice teacher training curriculum development and demonstration projects.

- Preschool, middle school, and adult education: supplementary materials and teacher training.

- Public awareness (becoming more observant and sensitive to ecological problems, partly through reading, listening, and reviewing of media materials on the environment), especially for 14 and above.

- Environmental manpower development (vocational and technical) at institutions of higher education awarding two-year degrees. Basic environmental education courses for college freshmen and sophomores.

- Introduction of environmental/ecological concepts to professionals (lawyers, engineers, city planners, etc.) who will need to relate to these ideas in continuing educational programs.

Additional areas of concern are in the development of educational personnel to reach professionals in need of environmental/ecological orientation; to develop an environmental/ecological consciousness in undergraduate and graduate students of the various professions; to assist in curriculum development and demonstration projects at the preschool, middle school, and adult level; to conduct programs of environmental awareness for preschool and elementary children; and to carry out retraining programs for environmental manpower technicians.

ROLE OF STATE AND FEDERAL AGENCIES

The techniques and curricula of environmental education cannot and should not come full blown from an agency of the Federal Government. The need for environmental education to prepare a citizenry willing and capable of protecting and preserving the environment has but recently been recognized in official actions and legislation at the national level. Indeed, environmental education has only come to the attention of a substantial part of the educational community in the past year. Much remains to be determined in both policy and techniques.

At the same time, in many local communities and in colleges and universities, important progress has been made in initiating and developing concepts of EE.

Many of the most highly innovative projects at the local level deserve being called to the attention of educators in other parts of the country. The identification and spotlighting of many of these special projects, to serve as models for national consideration, sets the stage for a major role for Federal assistance in the years ahead. This approach also encourages greater participation at the local level in the vital creative and developmental aspects of environmental education.

However, if individual communities are to achieve the recognition they deserve at the State and Federal level, it is essential to provide mechanisms that reflect their interests, needs, and resources. Recognizing this, the Office of Education has suggested that each State develop its own State commitment to environmental education.

THE STATE COMMITMENT TO EE

Increasing the level of participation at the local level achieves two specific objectives. It emphasizes the need to develop environmental education that is relevant to the particular needs of the community, and--at the same time--it carries out the mandate of the President and Congress to decentralize governmental structure (while giving coherence to the great variety of programs of the several Federal agencies now involved in environmental education). The State commitment may, as a beginning:

- Provide comprehensive State recognition and support for local models by clearly defining the support and coordination activities that can be provided them by State, national, and other organizations.

- Develop carefully defined priorities within the State for local, State, and Federal funding.

- Develop programs within the State to increase environmental awareness and disseminate information developed by other school systems.

- Coordinate all governmental and private environment activities, such as volunteer youth projects, with formal and nonformal environmental education activities of school and colleges.

SCHOOL SYSTEMS

Each school system within a State may originate action-oriented environmental education curricula that will involve the entire range of community resources (the school system itself, local government, community organizations, and business and industry) and, where feasible, such area resources as State and National Parks, reclaimed open space in urban areas, and community colleges and universities.

A number of school systems within a State where there are promising programs may be designated within the State commitment as demonstration projects to serve as models.

Each school system may want to coordinate its activities with local or area plans for environmental action and manpower training, in order to benefit from resources which may be identified in any State planning for curriculum development activities and teacher training.

ENVIRONMENTAL ACTIONS

Programs of environmental action may be developed at the local level by community organizations, local governments and other appropriate organizations. Working together in a Community Environmental Educational Center, many individuals may be motivated, trained, and involved. Ideally, these activities would be coordinated with educational programs. For instance, an environmental action program to measure the pollution levels of a local river system could be coordinated by a State agency, with data collection by high school students as part of their curriculum and by volunteers from community organizations, and with data analysis by the students and faculty of a nearby community college as part of a manpower training program for environmental technicians.

MULTIPLE FUNDING

Environmental education programs should be funded from a variety of Federal, State, local, and private sources. State and local planning agencies should take into consideration all of the sources of funds and make use of those best suited for each project.

An important principle of planning should be the use of matching funds. Any organization, private or public, which seeks funds should demonstrate the ability to provide resources of its own in talent, time, and money.

Requested funds should multiply the capabilities of an existing effort. Funds should not, ordinarily, be made available for the development of an idea which has not matured to the point that personnel, materials, and objectives are clearly foreseen.

NATIONAL COORDINATION

It is necessary to create programs and working relationships between established Government agencies for the purpose of more effectively utilizing existing skills and minimizing duplication of effort. Throughout the Federal Government there is a vast wealth of well trained and experienced individuals with skills directly relevant to environmental education.

The development of a national program in environmental education will begin with the collection and analysis of State and local programs and plans, the coordination of effort and resources in Federal agencies, and research and innovative programming by a core staff in Washington. The process will involve extensive reliance on the Regional Commissioners of the Office of Education, to insure full use of the ideas and resources at all levels of educational efforts in the Nation.

Part III

Looking To The Future

A NATIONAL COMMITMENT TO ENVIRONMENTAL EDUCATION

Beginning with the recognition by many individuals that a new attitude toward the environment--one of awareness and concern--is necessary to preserve the environment, we now have a national commitment to face and resolve environmental problems through educational means.

Individual concern and action is required in a democratic society *before* special interests (business, labor, universities) will act responsibly and *before* the Government will set guidelines or impose legal sanctions. Such a consensus, elicited through the educational process, is not only necessary, it provides the knowledge and the way to accomplish the objectives of environmental improvement.

As individuals reorient their lives to ecologically consistent styles, and groups and communities work through all social and political processes to redirect formal and nonformal education toward environmental and ecological goals, we have a national movement or commitment towards change.

The President of the United States has authority to pull together a wide range of Federal programs to give a truly coordinated and national thrust to EE. The Office of Education has been designated by the Environmental Education Act as the agency to plan and recommend such overall educational programs.

CITIZEN OF THE FUTURE

Man, having spent eons in the Stone Age learning to live with his environment and being responsive to it, has subsequently spent a few thousand years attempting to live apart from his natural environment--to control it for his own purposes--and has suffered many ecological dislocations as a result. Now, entering the age of Technological Man, he has faced up to the decision of either further separating himself from nature and from his environment (thereby dehumanizing himself) or of recognizing his dual nature and learning to live within his environment (protecting and restoring his environment, rather than debasing it, through the great powers of technology).

The same skills used by man in coordinating his knowledge and abilities to put a man on the moon may now be used to restore the environment and to provide for a satisfying life for great numbers of people without futher jeopardizing the biosphere of Earth.

The citizen of the future will be well aware of ecological processes, not merely as to nature as he has conceived it in the past but also with respect to man-made environments.

Environmental education enables man to retain his place as the dominant species, but it will also help him to find his place as part of a larger entity, the living Earth. Man will be highly educated in the best sense, rounded and whole, for his very life and life styles will be immensely enriched by environmental education.